Using Agricultural Education to Build a Regional Farm Safety Database

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Need For Innovative Idea

In the United States, agriculture, food, and other related industries are major contributors to the nation's gross domestic product, totaling nearly $1.264 trillion in 2021 (United States Department of Agriculture, 2022). Within these industries, however, farming has one of the highest fatal injury rates at 20 deaths per 100,000 full-time workers in 2021, while the rate for all U.S. industries is set at 3.6 deaths (Bureau of Labor Statistics, 2022a, 2022b). Due to the high rate of farm equipment incidents annually, it is evident that increased safety awareness and practice is a current need for farm operations and employees across the United States. With over 2.3 million individuals working and living on a farm and around farming equipment, including youth (Bureau of Labor Statistics, 2022b), it's important to include individuals of all ages when seeking out endeavors in agricultural education to increase farm safety and awareness. Since adults are the primary demographic employed in agriculture and related industries, efforts should made to inform and educate them about farm safety. Unfortunately, the motivation to learn and make changes to current practices can be challenging with adults; thus, many initiatives are pointed toward youth. However, the use of andragogical principles in adult safety education could help overcome these challenges.

Within andragogy, Knowles (1980) states that, in general, adults have a deep need to be self-directed in their learning. Self-Directed Learning Theory involves the interaction of three dimensions, motivation, self-monitoring, and self-management to guide one's self-directed learning (Garrison, 1997). When these three dimensions are involved in facilitating adult education programs, it is more likely to generate meaningful learning experiences and outcomes. Therefore, involving andragogical principles in adult farm safety education programs could help improve the effectiveness and continued awareness of farm safety practices across the country.

Currently, no regional database in the Southeast United States is available, nor large enough to help safety officials identify the farm implements, farm facilities, and areas within each that are red flag areas of concern (Hair, 1991). The scope of the database would become useful for the medical, engineering, education, and farming industries in giving perspective into the current state of farm safety and areas of improvement to develop safer farm communities.

How It Works

The Safe Farm Steward (SFS) Project is funded by the National Institute for Occupational Safety and Health, a branch of the Center for Disease Control and Prevention. The project encompasses nine states in the Southeast region of the United States (AR, GA, KY, MS, NC, SC, TN, VA, and WV). The SFS Project aims to bring awareness to the current state of safety on farms and recognize the farms that exemplify they are *stewards* of farm safety. Within the SFS Project, the SFS application serves as an evaluative tool to determine whether farms adequately maintain and update the safety features of their equipment and facilities. The application requires the preparer to include farm information and a safety level of *Good, Fair,* or *Replace*, based on visual observations, for each construct within each implement and farm facility present. Once the information is submitted, an overall farm score is generated. Applications are completed by postsecondary students and agriculture extension agents on the SFS website, where all the data is stored. Once the application is submitted, the agricultural education SFS research team reviews it

for errors or questionable entries and determines the status by using a cut score to decide whether the farm needs to make safety changes and revise its application or if it meets the threshold to become a Certified Safe Farm Steward.

Throughout the nine-state region, post-secondary faculty and agriculture extension agents meet in a southeastern community for a three-day educational program that prepares them for educating college students on how to use the service. The trainings are developed by the agricultural education SFS research team and facilitated utilizing the three dimensions of Self-Directed Learning Theory, including motivation, self-monitoring, and self-management.

Following the training, postsecondary faculty were expected to implement the SFS curriculum provided during the training into their courses to prepare their students to successfully complete one SFS application in their community. If a student chose to complete five or more SFS applications, then they would be certified as a Safe Farm Advocate, which permits them to begin training others on how to complete the SFS application. Agriculture extension agents received program materials to include in extension lessons to farmers in the community and were expected to complete 10 or more applications at farms in their community.

Results To Date/Implications

Following our first training in the summer of 2023, 204 SFS applications were submitted, with 166 farms being accepted and recognized as Safe Farm Stewards, 28 farms with applications in progress, and 10 farms whose applications require improved farm safety measures before they can become accepted. Among the accepted farms, we currently have information on 2,204 implements and facilities where all safety constructs are documented in an overall dataset. In addition, 166 students from the six postsecondary institutions have received the lessons designed by the agricultural education SFS research team.

Future Plans

To continue improving the students' knowledge base, a digital scanner and Meta Oculus were purchased that would allow access to visually comprehend each piece of equipment they could potentially evaluate. Recently the team released a series of videos that serve as an educational tool for faculty to share with students on how to complete the SFS application. Through the SFS Program, we aim to utilize both pedagogical and andragogical agricultural education to build a regional farm safety database that can be used by professionals to improve safety in the agricultural industry. Over the course of this program, our goal is to successfully admit 2,000 farms into the Safe Farm Steward program, which we anticipate will provide us with a dataset that contains information on at least 20,000 implements and facilities.

Cost/Resources Needed

This is a five-year project that encompasses a $1,500 annual stipend to each participating postsecondary institution; a sign for all admitted farm stewards; the housing allowance for the three-day training; the use of a graduate student for monitoring the SFS applications, redeveloping curriculum for faculty, and maintaining contact with the participants; and the digital work in virtual work, augmented work, educational videos, website, and mobile application. The overall five-year grant project, which serves as a research core at the Southeast Center for Agricultural Health and Injury Prevention, is valued at over $1.2 million.

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